

REMARKS

Claims 1-4 and 13-36 are pending in the present application. Claims 1-4 and 13-18 have been amended to recite “admixture for cement” in place of “cement admixture” for purposes of clarification and not to limit their scope. Claim 2 has been amended to correct the spelling of “exist” for purposes of clarification and not to limit its scope. Claims 1 and 2 have also been amended by removing superfluous parenthesis. Claims 15-18 have been amended by reciting “applying” in place of “executing” for purposes of clarification and not to limit their scope. Basis for this amendment can be found in the disclosure at page 35, line 14 and page 52, line 21 in the specification, which uses the term “applying” and “laying work” instead of the term “executing”, and the description concerning the term “executing” in page 37, lines 15 to 21 in the specification.

Claims 17 and 18 have been amended to recite “at least one compound (C2) selected from the group consisting of oxycarboxylic acid ---” in place of at least one compound (C2) selected from oxycarboxylic acid ---” for purposes of clarification and not to limit their scope. Claims 19-36 have been added. New claims 19 and 20 find support on page 26, lines 20 to 21, lines 9 to 12 and lines 28 to 31 of the specification. New claims 21 and 22 find support on page 26, lines 20 to 22, lines 31 to 32 of the specification. Claims 23 and 24 find support on page 12, lines 10 to 11 of the specification.

New Claims 25-32 have replaced now canceled claims 5-12, respectively, for more typical claim sequencing and correspond to now canceled claims 5-12, respectively, except for reciting “admixture for cement” in place of “cement admixture” and by canceling “type” for purposes of clarification and not to limit their scope. Accordingly claims 5-12 have been canceled without prejudice or disclaimer.

New Claims 33 and 34 find support on page 33, lines 19 to 24 of the specification. New claims 35 and 36 find support on page 40, lines 27 to 29 the specification.

The rejection of claims 1-18 under the judicially created doctrine of obviousness type double patenting as being unpatentable over claims 1-12 of US Patent 6,911,494 has been overcome by the filing of the attached Terminal Disclaimer. The filing of the Terminal Disclaimer is not to be construed as an admission, estoppel or acquiescence. See *Quad*

Environmental Technology v. Union Sanitary District, 20 USPQ2d 1392 (Fed. Cir. 1991) and *Ortho Pharmaceuticals Corp. v. Smith*, 22 USPQ2d 1119 (Fed. Cir. 1992).

Claims 1-18 were rejected under 35 USC 102(b) or 35 USC 102(e) as being anticipated by US Patent 6,911,494 to Yamashita et al.; JP 2003-12358; JP 2002-348160 or JP 7-215746. In addition, claims 1-18 were rejected under 35 USC 103(a) as being unpatentable over US Patent 6,911,494 to Yamashita et al.; JP 2003-12358; JP 2002-348160 or JP 7-215746. The cited references do not anticipate the present invention and do not render obvious the present invention.

With respect to the rejections of Claims 1-18 under 35 USC 102 as being anticipated by and under 35 USC 103(a) as being unpatentable US Patent 6,911,494 to Yamashita et al, the present application was filed within one year of the publication of the application that matured into US Patent 6,911,494 and therefore it is not a reference under 35 USC 102(b). In addition, since the inventors in this application and those in US Patent 6,911,494 are identical, US Patent 6,911,494 is not a reference under 35 USC 102(e).

Also, with respect to the rejection of Claims 1-18 under 35 USC 103(a) as being unpatentable over US Patent 6,911,494 to Yamashita et al, attached is a "Statement of Common Ownership" that the invention of US 6,911,494 and the present application were commonly owned by Nippon Shokubai Co., Ltd. when the present application was made and are presently commonly owned. Accordingly, in view of the common ownership, the rejection under 35 USC 103(a) is not tenable pursuant to 35 USC 103(c).

JP 2003-012358 fails to anticipate or render obvious the present invention. JP 2003-012358 suggests a polyalkylene glycol ether monomer included in the unsaturated (poly)alkylene glycol ether monomer (a) of the present invention. However, the polyalkylene glycol ether monomers used in Examples of JP 2003-012358 are only obtained by the addition of ethylene oxide to 3-methyl-3-buten-1-ol, and therefore, the monomers have an alkenyl group contain 5 carbon atoms.

JP 2003-012358 fails to teach or suggest that the copolymer is used with the non-polymerizable (poly)alkylene glycol (B) having no alkenyl group.

Meanwhile, as described on page 4, lines 24 to 34 of the specification of the present application, a mixture comprising three components of a particular copolymer (A), the particular

unsaturated (poly)alkylene glycol ether monomer (a) and a non-polymerizable (poly)alkylene glycol (B) having no alkenyl group is available as an admixture for cement exhibiting viscosity decreasing ability as well as high dispersing ability and slump loss preventing ability particularly in the high water reducing ratio range.

While JP 2003-012358 shows experimental results in that the water/cement ratio (by mass) is “0.65”, it does not estimate slump loss preventing ability and viscosity decreasing ability in a high water reducing ratio range (e.g. the case when the water/cement ratio is “0.30”, as the present specification). Further, there is no description or suggestion concerning viscosity decreasing ability in JP 2002-348160. On the other hand, it has been demonstrated that the admixture for cement of the present invention exhibits viscosity decreasing ability as well as a high dispersing ability and slump loss preventing ability even in a high water reducing ratio range.

JP 2002-348160 fails to anticipate or render obvious the present invention. JP 2002-348160 suggests a composition comprising a copolymer obtained by copolymerization of an unsaturated (poly)alkylene glycol ether monomer and unsaturated carboxylic acid and sulfonic acid dispersing agent. The copolymer is similar to the copolymer of US 6,911,494, which is prepared by using the unsaturated (poly)alkylene glycol ether monomer containing “the alkenyl group contain 5 to 8 carbon atoms”.

According to the present invention, the carbon number of the alkenyl group contained in the unsaturated (poly)alkylene glycol ether monomer (a) is 2 to 4 (please see the Y in claim 1), and thereby the monomer and the copolymer of JP 2002-348160 differ from that of the present invention.

This difference in the carbon number of the alkenyl group causes the distinction in stability of the unsaturated (poly)alkylene glycol ether monomer (a) prepared by addition of alkyleneoxide to unsaturated alcohol. In particular, when “the alkenyl group containing 5 to 8 carbon atoms” is used, it is difficult to synthesize “high molar-adduct of alkyleneoxide” (i.e. the claimed “admixture for cement”) showing the excellent viscosity decreasing ability and the excellent slump loss preventing ability. That is, the produced amount of the non-polymerizable (poly)alkylene glycol (B) having no alkenyl group is too large.

Along these lines, applicants have provided comparative data to demonstrate that the difference in the carbon number of the alkenyl group causes the distinction in stability of the unsaturated (poly)alkylene glycol ether monomer. However, JP 2002-348160 fails to disclose a specific embodiment using the above-mentioned copolymer with the unsaturated (poly)alkylene glycol ether monomer containing “the alkenyl group contain 5 to 8 carbon atoms” and the non-polymerizable (poly)alkylene glycol (B) having no alkenyl group. Consequently, the Examples of US 6,911,494 were used as comparative examples. The copolymer of US 6,911,494 is, as mentioned above, similar to that of JP 2002-348160, since it is prepared by using the unsaturated (poly)alkylene glycol ether monomer containing the alkenyl group containing “the alkenyl group containing 5 to 8 carbon atoms.

The attached Table II shows comparison data of Examples 1, 3 and 4 of the invention of the present application (Please see Table 3 on page 74 in the specification) with Examples 1, 2, 5, 6 of US 6,911,494 (Please see Table 2 in column 37 and Table 3 in column 39) and two further experiments. Please see the composition shown in the attached Table I. Also attached is a Declaration under 35 U.S.C §1.132 that describes the details of the experiments carried out and summarized in the attached Tables 1 and II.

In addition, the conditions and methods for evaluation tests of concrete described in the specification of the present application are the same as that of US 6,911,494.

In Examples 1, 3 and 4 of the present invention, the copolymers are obtained by polymerization of an unsaturated polyalkylene glycol ether monomer prepared by addition of ethyleneoxide to methallyl alcohol and maleic acid.

In Examples 1, 2, 5, 6 of US 6,911,494, the copolymers are obtained by polymerization of an unsaturated polyalkylene glycol ether monomer prepared by addition of ethyleneoxide to 3-methyl-3-buten-1-ol and maleic acid or acrylic acid.

In the further experiments, the copolymers are obtained by polymerization of an unsaturated polyalkylene glycol ether monomer prepared by addition of an average of 200 mol of ethyleneoxide to 3-methyl-3-buten-1-ol and maleic acid or acrylic acid.

Table II shows the following results.

(I) When “MAL-200: EO-adduct (200 mol) of methallyl alcohol (the carbon number of the alkenyl group is 4)” is used in Example 4 of the present invention, the spreading speed is the

fastest, and the dispersion retaining ratio after 90 minutes is the highest and the changing in slump flow value with time is the smallest (= be excellent in slump loss preventing ability).

(II) When “IPN-200: EO-adduct (200 mol) of 3-methyl-3-buten-1-ol (the carbon number of the alkenyl group is 5)” is used in further experiments, in each case of using the comparative admixture for cement (A) or (B), the spreading speed is slower and the dispersion retaining ratio after 90 minutes is lower and the changing in slump flow value with time is higher than those of the above-mentioned Example 4 of the present invention, even though the addition amounts of these admixtures to cement (“0.46%” and “0.38%”) are more than those of the above-mentioned Example 4 of the present invention.

Accordingly, the difference in the number of carbon atoms containing in the alkenyl group represented by “Y” in the formula (1) causes the marked distinction in stability of the unsaturated (poly)alkylene glycol ether monomer (a) prepared by addition of alkylene oxide to unsaturated alcohol. In particular, when “the alkenyl group containing 5 to 8 carbon atoms” is used, it is difficult to synthesize the “high molar-adduct of alkylene oxide” (i.e. the claimed “admixture for cement”) showing the excellent viscosity decreasing ability and the excellent slump loss preventing ability. That is, the produced amount of the non-polymerizable (poly)alkylene glycol (B) having no alkenyl group is too large.

Therefore, it is demonstrated that the claimed admixture for cement achieves superior result and advantage in showing viscosity decreasing ability and slump loss preventing ability as compared to the admixture of US 6,911,494 comprising the copolymer similar to JP 2002-348160. That is, it is shown that the claimed admixtures achieve superior result and advantage as compared to the admixture of JP 2002-348160 as well as to that of US 6,911,494.

While JP 2002-348160 shows experimental results in that the water/cement ratios (by mass) are “0.55” and “0.40”, it does not estimate slump loss preventing ability and viscosity decreasing ability in a high water reducing ratio range (e.g. the case where the water/cement ratio is “0.30”). Further, there is no description or suggestion about viscosity decreasing ability in JP 2002-348160.

JP 07-215746 fails to anticipate or render obvious the present invention. It is important to note that the summary/abstract translation of JP 07-215746 filed as Information Disclosure

Statement had a mistake. This summary/abstract translation was published by Japan Patent Office and is in error. In particular, the translation incorrectly states that said “Y is a hydrocarbon having 2-22 carbon number”, but the correct translation is that “Y is a hydrocarbon having 8-22 carbon number”. If the examiner desires, a verified translation of the relevant portions of JP 07-215746 will be provided.

However, JP 07-215746 fails to teach or suggest that the copolymer (A) is used with the unsaturated (poly)alkylene glycol ether monomer (a), since there is no description about a conversion of each starting monomer (it teaches an amount of (an) unreacted monomer(s)).

Also, while JP 07-215746 shows the experimental results in that the water/cement ratio (by mass) is “0.369”, it does not estimate slump loss preventing ability and viscosity decreasing ability in a high water reducing ratio range (e.g. the case where the water/cement ratio is “0.30”). Further, there is no description or suggestion about viscosity decreasing ability in JP 07-215746.

In addition, JP 07-215746 is even more remote with respect to claims 19 and 20 which recite that “the oxyalkylene group composing the non-polymerizable (poly)alkylene glycol (B) having no alkenyl group is one or more species of oxyalkylene groups containing 2 to 18 carbon atoms, and the oxyalkylene group comprises an oxyethylene group accounting for at least 50 mole percent, and the terminal group of the non-polymerizable (poly)alkylene glycol (B) having no alkenyl group is a hydrogen atom or an alkyl group containing 1 to 4 carbon atoms.” This recitation further differentiates between the polyoxyalkylene derivative (B) (= an oxyalkylene antifoaming agent) of JP 07-215746 and the non-polymerizable (poly)alkylene glycol (B) having no alkenyl group of the present invention.

In view of the above amendment, applicant believes the pending application is in condition for allowance.

In the event that the Examiner believes that another interview would serve to advance the prosecution of this application, the undersigned is available at the number noted below.

Application No. 10/791,729
Amendment dated February 12, 2007
Reply to Office Action of August 16, 2006

Docket No.: 21581-00316-US

Please charge \$1020.00 to our Deposit Account No. 22-0185, under Order No. 21581-00316-US from which the undersigned is authorized to draw.

Dated:

Respectfully submitted,

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JP 2003-95722

Title of Invention: ADMIXTURE FOR CEMENT

5 Date of Publication of Application: April 3, 2003

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:

Akihiko Yamashita et al.

Serial No.: 10/791,729 Art Unit: 1714

Filed : March 4, 2004 Examiner: SZEKELY PETER A

Title : CEMENT ADMIXTURE, CEMENT COMPOSITION AND METHOD
FOR LAYING WORK THE SAME, AND METHOD FOR PRODUCING CEMENT
HARDENED PRODUCT

DECLARATION UNDER RULE 1.132

Honorable Commissioner of Patents and Trademarks,
Washington, D.C. 20231

Sir:

I, Akihiko Yamashita, a citizen of Japan and having
postal mailing address of Gakuencho 5-5-601, Ibaraki-shi,
Osaka 567-0833 Japan, declare and say that:

March 1984, I was graduated from Nagoya Institute of
Technology, and received a Master of synthetic chemistry;

From April 1984, up till the present, I have been
employed by Nippon Shokubai Co., Ltd., and engaged in the
works of Radical polymerization of Acrylic Polymer;

I am one of the inventors of the above-identified
application am familiar with the subject matter thereof;

I have read the Office Action mailed and the
references cited therein and am familiar with the subject
matter thereof;

I respectfully submit herewith my exact report
thereon;

(1) Purpose

To show the pronounced effect of the claimed admixture for cement by comparing the admixture with the admixture for cement of US 6,911,494 comprising the copolymer similar to JP 2002-348160

(2) Brief Summary Of Experiment

<Production Example>

(Production of EO-adduct (200 mol) of 3-methyl-3-buten-1-ol (IPN-200))

An alkylene oxide addition reaction was performed according to the reaction conditions described in Production Example 1 of US 6,911,494. The amount of the catalyst used for the reaction and the temperature during the reaction were the same as those in the Production Example 1 of US 6,911,494.

A stainless-made high-pressure reaction vessel equipped with a thermometer, a stirrer, and nitrogen and alkylene oxide inlet tube was charged with 58.5 parts (=parts by mass) of 3-methyl-3-buten-1-ol as an unsaturated alcohol and 3.1 parts of sodium hydroxide as a catalyst for addition reaction. Reaction vessel inside was purged with nitrogen with stirring and then heated to 120°C in a nitrogen atmosphere. Then, under safe pressure, maintaining the temperature at 120°C, 6600 parts of ethylene oxide was introduced to the reaction vessel. The temperature was maintained at 120°C until the alkylene oxide addition reaction was completed to drive the reaction to completion. The obtained reaction product (hereinafter referred to as "M-A") includes polyalkylene glycol (polyethylene glycol) as a byproduct, and an unsaturated polyalkylene glycol ether monomer (hereinafter referred to as "IPN-200") derived from 3-methyl-3-butane-1-ol by addition of 200 moles, on average,

of ethylene oxide. The production amount of polyethylene glycol was 47.1% by mass relative to the unsaturated polyalkylene glycol ether monomer. The production amount of polyethylene glycol was measured under the measurement conditions described in page 53, line 31 to page 54, line 5 of the present specification.

This result is compared with the result of the "unsaturated polyalkylene glycol ether monomer prepared by addition of an average of 200 mol of ethylene oxide to methallyl alcohol" having the "alkenyl group containing 4 carbon atoms", which shows that the production amount of the polyethylene glycol is remarkably higher in comparison to 12.0% of the polyethylene glycol production amount in MAL-200, even though the addition reaction was performed under a more moderate condition at a temperature of 120°C lower than 150°C of the addition reaction temperature in MAL-200. Therefore, it is found that the "unsaturated polyalkylene glycol ether monomer" having the "alkenyl group containing 5 carbon atoms" is inferior in stability to the "unsaturated polyalkylene glycol ether monomer" having the "alkenyl group containing 4 carbon atoms", and that it is difficult to synthesize the "high molar-adduct of alkylene oxide".

<Further Comparative Example A> (Production of Comparative admixture for cement (A))

A Comparative admixture for cement (A) was prepared under the polymerization method described in "Production Example 11 - Production of Cement admixture (A-4)", which is described in page 60, lines 3 to 25 of the present specification. The composition ratio of the monomers charged (unsaturated polyalkylene glycol ether monomer (a)/maleic acid (% by mass)) was the same as in the "Production Example 11". In order to adjust the viscosity of the reaction system, the polymerization reaction was

performed at a polymerization component concentration of 52%.

A glass-made reaction vessel equipped with a thermometer, a stirrer, a dropping funnel, a nitrogen inlet tube, and a reflux condenser was charged with 376 parts of deionized water, 588.4 parts of the reaction product obtained in the above-mentioned Production Example (M-A) (containing 400 parts of IPN-200 and 188.4 parts of polyethylene glycol), and 12.1 parts of maleic acid, and the reaction vessel inside was purged with nitrogen with stirring, and then heated to 65°C in a nitrogen atmosphere. Maintaining the temperature in the vessel at 65°C, an aqueous hydrogen peroxide solution composed of 0.102 parts of hydrogen peroxide and 1.93 parts of deionized water was added thereto. Then, an aqueous solution prepared by dissolving 0.131 parts of L-ascorbic acid in 2.50 parts of deionized water was added dropwise over 1 hour. Thereafter, the temperature was further maintained at 65°C for 1 hour, and thereafter the polymerization reaction was finished. The reaction mixture was then neutralized to pH 7 with an aqueous solution of sodium hydroxide at a temperature not higher than the polymerization reaction temperature to give a Comparative admixture for cement (A).

<Further Comparative Example B> (Production of Comparative admixture for cement (B))

A Comparative admixture for cement (B) was prepared according to the polymerization method of Production Example 5 in Reference US 6,911,494. In order to adjust the viscosity of the reaction system, the polymerization reaction was performed at a polymerization component concentration (% by mass concentration of all monomer components relative to all raw materials) of 52%.

A glass-made reaction vessel equipped with a

thermometer, a stirrer, a dropping funnel, a nitrogen inlet tube, and a reflux condenser was charged with 378 parts of deionized water, 588.4 parts of the reaction product obtained in the above-mentioned Production Example (M-A) (containing 400 parts of IPN-200 and 188.4 parts of polyethylene glycol), and then heated to 65°C. Maintaining the temperature in the vessel at 65°C, an aqueous hydrogen peroxide solution composed of 0.183 parts of hydrogen peroxide and 3.48 parts of deionized water was added thereto. Then, 16.1 parts of acrylic acid was added dropwise over 3 hours, and simultaneously an aqueous solution prepared by dissolving 0.237 parts of L-ascorbic acid and 1.65 parts of 3-mercaptopropionate in 4.5 parts of deionized water was added dropwise over 3.5 hours. Thereafter, the temperature was further maintained at 65°C for 1 hour, and thereafter the polymerization reaction was finished. The reaction mixture was then neutralized to pH 7 with an aqueous solution of sodium hydroxide at a temperature not higher than the polymerization reaction temperature to give a Comparative admixture for cement (B).

In the Production Example, the conversion (%) of each starting monomer, and analysis result of the copolymer contained in Admixture for cement obtained, namely the composition ratio of copolymer (% by mass), amount of the constituent unit derived from unsaturated polyalkylene glycol ether monomer (monomer (a)) (mole %), the carboxylic acid content (meq/g) on the basis of the unneutralized copolymer, weight-average molecular weight, the content of unsaturated polyalkylene glycol ether monomer (monomer (a)) relative to the neutralized copolymer (% by mass), and the content of non-polymerizable polyalkylene glycol (B) having no alkenyl

group relative to the neutralized copolymer (% by mass) are shown in Table I.

The conversion of each starting monomer and the weight average molecular weight of the copolymer were measured according to the methods described in page 54, lines 11 to 35 of the present specification, respectively.

Concrete compositions were prepared by using the Comparative admixture for cement (A) or (B) prepared as mentioned above, and then change in the slump flow value by time and spreading speed were measured. Mixing composition, preparing method and evaluation method of each concrete composition were measured according to the methods described in page 72, line 8 to page 73, line 32 of the present specification, respectively. Results are shown in Table II.

"Dispersion retaining ratio (%)" in Table II was measured by measuring the change of the slump flow value with the lapse of time comparing the ratio (%) of the slump flow value after 60 minutes or 90 minutes from the start of mixing with that after 5 minutes from the start of mixing. The higher the numerical value of the dispersing capability retention ratio (%) was, the more excellent dispersion retaining ability was.

For reference, we also show the results of Examples 1, 3 and 4 of the present invention, which are described in Table 3 in page 74 of the present specification, and Examples 1, 2, 5, 6 of US 6,911,494, which are described in Table 2 in column 37 and Table 3 in column 39, in Table II.

Examples 1, 3 and 4 of the present invention use the copolymers obtained by polymerization of an unsaturated polyalkylene glycol ether monomer prepared by addition of ethyleneoxide to methallyl alcohol and maleic acid,

Examples 1, 2, 5, 6 of US 6,911,494 use the copolymers obtained by polymerization of an unsaturated polyalkylene glycol ether monomer prepared by addition of ethyleneoxide to 3-methyl-3-buten-1-ol and maleic acid or acrylic acid, and

the further experiments use the copolymers obtained by polymerization of an unsaturated polyalkylene glycol ether monomer prepared by addition of an average of 200 mol of ethyleneoxide to 3-methyl-3-buten-1-ol and maleic acid or acrylic acid.

Table I

Admixture for cement	Species of monomer	Conversion (%) of each starting monomer		Composition ratio of copolymer (%) by mass)	Amount of constituent unit derived from AO monomer (mole %)	Carboxylic acid content (meq/g) on the basis of unneutralized copolymer	Weight average molecular weight	AO monomer content (%) *1	Polyalkylene glycol content (%) *2
		AO monomer/MA/other	MA/other						
Comparative admixture for cement (A)	IPN-200/MA	70.0/0.0/60.4		97.5/0.0/2.5	33.4	0.44	44000	41.4	65
Comparative admixture for cement (B)	IPN-200/AA	84.0/97.0/0.0		95.5/4.5/0.0	14.8	0.62	30500	18	52.9

note: *1 and *2 means the content (% by mass) of each compound relative to the neutralized copolymer.

Monomer code:

IPN-200: EO-adduct (n= 200 mol) of 3-methyl-3-buten-1-ol

MA: Maleic acid

AA: Acrylic acid

Table II

	Admixture for cement	Species of Monomer	Average molar number of addition of the oxyalkylene groups (n)	Number of carbon atoms of alkenyl groups	Amount used of cement admixture /cement (%)	Amount of copolymer (A) /cement (%)	Amount of monomer (a) /copolymer (A) (%)	Amount of polyalkylene glycol (B) /copolymer (A) (%)	Slump flow value (mm)			Spreading speed (sec)	Dispersion retaining ratio (%)		
									After 5 min	After 60 min	After 90 min		After 60min / After 5min	After 90min / After 5min	
The present invention	Example 1	Cement admixture (A-1)	MAL-50/MA	50	4	0.210	0.1818	10.6	4.9	645	530	400	11.4	82.2	62.0
	Example 3	Cement admixture (A-3)	MAL-100/MA	100	4	0.220	0.1696	22.3	7.4	610	525	433	9.8	86.1	71.0
	Example 4	Cement admixture (A-4)	MAL-200/MA	200	4	0.280	0.1810	38.5	16.2	580	527	470	9.0	90.9	81.0
	Example 1	Cement admixture (1)	IPN-50/AA	50	5	0.220	0.1972	5.2	6.4	630	520	397	9.8	82.5	63.0
US 6911494	Example 2	Cement admixture (2)	IPN-100/AA	100	5	0.220	0.1825	10.8	9.7	620	515	400	9.3	83.1	64.5
	Example 5	Cement admixture (5)	IPN-50/MA	50	5	0.240	0.2033	11.4	6.6	580	510	395	10.7	87.9	68.1
	Example 6	Cement admixture (6)	IPN-100/MA	100	5	0.260	0.1918	24.5	11.1	617	550	418	11.2	89.1	67.7
Further experiment		Comparative admixture for cement (A)	IPN-200/MA	200	5	0.460	0.2230	41.4	65.0	620	530	370	10.5	85.5	59.7
		Comparative admixture for cement (B)	IPN-200/AA	200	5	0.380	0.2225	18.0	52.9	630	520	365	9.6	82.5	57.9

Monomer code:

MAL-50: EO-adduct (n= 50 mol) of methallyl alcohol
MAL-100: EO-adduct (n= 100 mol) of methallyl alcohol
MAL-200: EO-adduct (n= 200 mol) of methallyl alcohol
IPN-50: EO-adduct (n= 50 mol) of 3-methyl-3-buten-1-ol
IPN-100: EO-adduct (n= 100 mol) of 3-methyl-3-buten-1-ol
IPN-200: EO-adduct (n= 200 mol) of 3-methyl-3-buten-1-ol
MA: Maleic acid
AA: Acrylic acid